UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/593,784	09/22/2006	Yuriko Suzuki	296731US40PCT	4031

22850 7590 12/08/2010

OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.
1940 DUKE STREET
ALEXANDRIA, VA 22314

EXAMINER	
WEST, JEFFREY R	

ART UNIT	PAPER NUMBER
2857	

NOTIFICATION DATE	DELIVERY MODE
12/08/2010	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com
oblonpat@oblon.com
jgardner@oblon.com

Office Action Summary	Application No.	Applicant(s)	
	10/593,784	SUZUKI ET AL.	
	Examiner	Art Unit	
	JEFFREY R. WEST	2857	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *14 July 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-3,5-7,9-11 and 13-15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-3,5-7,9-11 and 13-15* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *22 September 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on July 14, 2010, has been entered.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-3, 5, 7, 9, 11, and 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al, "Arrayed Air Jet Based Haptic Display: Implementing an Untethered Interface" in view of U.S. Patent No. 4,919,507 to DeBerg.

With respect to claim 1, Suzuki discloses a force feedback method comprising: placing a receiver at a predetermined height above a plurality of nozzles arranged on a plane, the receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (page 1, column 2, lines 17-25 and Figures 1 and 2), selecting a nozzle from among a plurality of candidate nozzles arranged on the plane, the selected nozzle having a smallest distance between the selected nozzle and the axis of symmetry of the receiver (page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), jetting a gas or a liquid from the selected nozzle upon an inclined side surface unit of the receiver to convey a force in a direction perpendicular to a direction of the jetting gas or liquid (i.e. due to the curvature of the receiver, when the air hits the curved side of the receiver, the force received inherently includes a perpendicular force) (page 1, column 2, line 17 to page 2, column 1, line 2, page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), wherein each of the plurality of candidate nozzles is positioned on the plane in an area below an area of the receiver between an inner border of the inclined side surface unit and an outer border of the inclined side surface unit (i.e. a nozzle is independently selected when the receiver is detected to be above the nozzle. Detection above the nozzle is

based on a determination that the nozzle lies within an outer border of the dome and an inner border of the receiver) (page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), and an angle difference between a first direction from each candidate nozzle to the axis of symmetry of the receiver and a second direction of a force to be provided to the receiver is equal to or less than a predetermined value, the first direction and the second direction being perpendicular to the direction of the jetting gas or liquid (page 1, column 2, line 17 to page 2, column 1, line 2, page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2).

As noted above, the invention of Suzuki teaches many of the features of the claimed invention and while the invention of Suzuki does teach an air receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit, Suzuki does not explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry.

DeBerg teaches a windmill comprising a rigid air receiver (column 4, lines 1-3) including a concave center unit (i.e. "24A") that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (column 2, lines 52-59, column 3, lines 23-28, and Figure 3) and an inclined side surface unit (i.e. inclined side surface of "26A") that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry (column 2, lines 52-59, column 3, lines 23-28, and Figure 3).

It would have been obvious to one having ordinary skill in the art to modify the air receiver in the invention of Suzuki to explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry, as taught by DeBerg, because DeBerg suggests a corresponding air receiver that would have improved the invention of Suzuki by providing a receiver with additional concave units that will occupy a larger space, consequently, a larger number of air jets in Suzuki, and make the maximum use of the force detection and haptic feedback system (column 3, lines 23-33).

With respect to claim 2, Suzuki discloses further comprising the step of: positioning the inclined side surface unit is changed according to a position or an orientation of the receiver (i.e. when the receiver is moved from a current position to a new position, the position of the inclined side surface unit moves accordingly) (page 2, column 1, lines 3-17 and Figures 1 and 2).

With respect to claim 3, Suzuki discloses further comprising the step of: calculating a virtual object according to the position or the orientation of the receiver so as to display a virtual space including the virtual object based on a result of the calculating (page 1, column 1, lines 1-13 and page 2, column 1, lines 3-21).

With respect to claim 5, Suzuki discloses a force feedback apparatus comprising: jetting means for jetting a gas or a liquid from a plurality of nozzles arranged in a plane (page 1, column 2, lines 17-25 and Figures 1 and 2), receiver means including

a concave center unit that declines radially outward from an axis of symmetry of the receiver mans to an outer border of the concave center unit for conveying a force perpendicular to a direction of the jetting gas or liquid (i.e. due to the curvature of the receiver, when the air hits the curved side of the receiver, the force received inherently includes a perpendicular force) (page 2, lines 3-17 and Figures 1 and 2), the receiver means placed at a predetermined height above the plane (page 1, column 2, lines 17-25 and Figures 1 and 2) jet control means (page 1, column 2, line 17 to page 2, column 1, line 2, and page 2, column 1, lines 3-17 and 38-48) for selecting a nozzle from among a plurality of candidate nozzles arranged on the plane and controlling the jetting means for jetting the gas or the liquid from the selected nozzle, the selected nozzle having a smallest distance between the selected nozzle and the axis of symmetry of the receiver means (page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), wherein each of the plurality of candidate nozzles is positioned on the plane in an area below an area of the receiver means between an inner border of the inclined side surface means and an outer border of the inclined side surface unit (i.e. a nozzle is independently selected when the receiver is detected to be above the nozzle. Detection above the nozzle is based on a determination that the nozzle lies within an outer border of the dome and an inner border of the receiver) (page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), and an angle difference between a first direction from each candidate nozzle to the axis of symmetry of the receiver means and a second direction of a force to be provided to the receiver is equal to or less than a

predetermined value, the first direction and the second direction being perpendicular to the direction of the jetting gas or liquid (page 1, column 2, line 17 to page 2, column 1, line 2, page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2).

As noted above, the invention of Suzuki teaches many of the features of the claimed invention and while the invention of Suzuki does teach an air receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit, Suzuki does not explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry.

DeBerg teaches a windmill comprising a rigid air receiver (column 4, lines 1-3) including a concave center unit (i.e. "24A") that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (column 2, lines 52-59, column 3, lines 23-28, and Figure 3) and an inclined side surface unit (i.e. inclined side surface of "26A") that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry (column 2, lines 52-59, column 3, lines 23-28, and Figure 3).

It would have been obvious to one having ordinary skill in the art to modify the air receiver in the invention of Suzuki to explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry, as taught by DeBerg, because DeBerg suggests a corresponding air receiver that would have improved the invention of Suzuki by providing a receiver with additional concave units that will occupy a larger space,

consequently, a larger number of air jets in Suzuki, and make the maximum use of the force detection and haptic feedback system (column 3, lines 23-33).

With respect to claim 7, Suzuki discloses further comprising: virtual object calculation means for calculating a virtual object in a virtual space according to the position or the orientation of the receiver means, as measured by the receiver measurement means, and for causing a virtual object display means to display the virtual space including the virtual object based on a result of the calculation (page 1, column 1, lines 1-13 and page 2, column 1, lines 3-21).

With respect to claim 9, Suzuki discloses a non-transitory computer readable storage medium for storing a program for causing a computer to realize a force feedback method, the program, when executed by a processor of the computer, causing the computer to execute the steps of (page 1, column 1, lines 1-13 and page 2, column 1, lines 3-21): selecting a nozzle from among a plurality of candidate nozzles arranged on the plane, the selected nozzle having a smallest distance between the selected nozzle and a center axis of a receiver (page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), the receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (page 1, column 2, lines 17-25 and Figures 1 and 2), jetting a gas or a liquid from the selected nozzle upon an inclined side surface unit of the receiver to convey a force in a direction perpendicular to a direction of the

jetting gas or liquid (i.e. due to the curvature of the receiver, when the air hits the curved side of the receiver, the force received inherently includes a perpendicular force) (page 1, column 2, line 17 to page 2, column 1, line 2, page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), wherein each of the plurality of candidate nozzles is positioned on the plane in an area below an area of the receiver between an inner border of the inclined side surface unit and an outer border of the inclined side surface unit (i.e. a nozzle is independently selected when the receiver is detected to be above the nozzle. Detection above the nozzle is based on a determination that the nozzle lies within an outer border of the dome and an inner border of the receiver) (page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2), and an angle difference between a first direction from each candidate nozzle to the axis of symmetry of the receiver and a second direction of a force to be provided to the receiver is equal to or less than a predetermined value, the first direction and the second direction being perpendicular to the direction of the jetting gas or liquid (page 1, column 2, line 17 to page 2, column 1, line 2, page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2).

As noted above, the invention of Suzuki teaches many of the features of the claimed invention and while the invention of Suzuki does teach an air receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit, Suzuki does not explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry.

DeBerg teaches a windmill comprising a rigid air receiver (column 4, lines 1-3) including a concave center unit (i.e. "24A") that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (column 2, lines 52-59, column 3, lines 23-28, and Figure 3) and an inclined side surface unit (i.e. inclined side surface of "26A") that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry (column 2, lines 52-59, column 3, lines 23-28, and Figure 3).

It would have been obvious to one having ordinary skill in the art to modify the air receiver in the invention of Suzuki to explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry, as taught by DeBerg, because DeBerg suggests a corresponding air receiver that would have improved the invention of Suzuki by providing a receiver with additional concave units that will occupy a larger space, consequently, a larger number of air jets in Suzuki, and make the maximum use of the force detection and haptic feedback system (column 3, lines 23-33).

With respect to claim 11, Suzuki discloses the program further causing the computer to function as execute the steps of: calculating a virtual object in a virtual space according to the position or the orientation of the receiver measured by the receiver measurement unit and causing a virtual space display means to display the virtual space including the virtual object based on a result of the calculation (page 1, column 1, lines 1-13 and page 2, column 1, lines 3-21).

With respect to claim 13, Suzuki discloses a force feedback method, comprising: selecting one or more of a plurality of nozzles arranged in a plane (page 1, column 2, lines 17-25 and Figures 1 and 2); jetting a gas or a liquid from the selected one or more nozzles upon a center of a receiver to convey a force in a direction of the jetting gas or liquid, the receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (page 2, lines 3-17 and Figures 1 and 2); and jetting the gas or the liquid from the selected one or more nozzles upon an inclined side surface of the receiver to convey a force in a direction perpendicular to the direction of the jetting gas or liquid (i.e. due to the curvature of the receiver, when the air hits the curved side of the receiver, the force received inherently includes a perpendicular force) (page 1, column 2, line 17 to page 2, column 1, line 2, page 2, column 1, lines 3-17 and 38-48, and Figures 1 and 2).

As noted above, the invention of Suzuki teaches many of the features of the claimed invention and while the invention of Suzuki does teach an air receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit, Suzuki does not explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry.

DeBerg teaches a windmill comprising a rigid air receiver (column 4, lines 1-3) including a concave center unit (i.e. "24A") that declines radially outward from an

axis of symmetry of the receiver to an outer border of the concave center unit (column 2, lines 52-59, column 3, lines 23-28, and Figure 3) and an inclined side surface unit (i.e. inclined side surface of "26A") that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry (column 2, lines 52-59, column 3, lines 23-28, and Figure 3).

It would have been obvious to one having ordinary skill in the art to modify the air receiver in the invention of Suzuki to explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry, as taught by DeBerg, because DeBerg suggests a corresponding air receiver that would have improved the invention of Suzuki by providing a receiver with additional concave units that will occupy a larger space, consequently, a larger number of air jets in Suzuki, and make the maximum use of the force detection and haptic feedback system (column 3, lines 23-33).

With respect to claim 14, Suzuki discloses a force feedback apparatus, comprising: a plurality of nozzles arranged in a plane, each nozzle to jet a gas or a liquid (page 1, column 2, lines 17-25 and Figures 1 and 2); a receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit to convey a force in a direction of the jet gas or liquid and including an inclined side surface to convey a force perpendicular to the direction of the jet gas or liquid (i.e. due to the curvature of the receiver, when the air hits the curved side of the receiver, the force received

inherently includes a perpendicular force) (page 2, lines 3-17 and Figures 1 and 2); and a controller to control one or more of the plurality nozzles to jet the gas or the liquid upon the concave center unit and the inclined side surface (page 2, lines 3-17 and Figures 1 and 2).

As noted above, the invention of Suzuki teaches many of the features of the claimed invention and while the invention of Suzuki does teach an air receiver including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit, Suzuki does not explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry.

DeBerg teaches a windmill comprising a rigid air receiver (column 4, lines 1-3) including a concave center unit (i.e. "24A") that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (column 2, lines 52-59, column 3, lines 23-28, and Figure 3) and an inclined side surface unit (i.e. inclined side surface of "26A") that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry (column 2, lines 52-59, column 3, lines 23-28, and Figure 3).

It would have been obvious to one having ordinary skill in the art to modify the air receiver in the invention of Suzuki to explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry, as taught by DeBerg, because DeBerg suggests a corresponding air receiver that would have improved the invention of Suzuki by

providing a receiver with additional concave units that will occupy a larger space, consequently, a larger number of air jets in Suzuki, and make the maximum use of the force detection and haptic feedback system (column 3, lines 23-33).

With respect to claim 15, Suzuki discloses a non-transitory computer readable storage medium storing therein a program, which, when executed by a computer processor, causes the computer to execute a force feedback method (page 1, column 1, lines 1-13 and page 2, column 1, lines 3-21), comprising the steps of: selecting one or more of a plurality of nozzles arranged in a plane (page 1, column 2, lines 17-25 and Figures 1 and 2); jetting a gas or a liquid from the selected one or more nozzles upon a concave center unit of a receiver to convey a force in a direction of the jetting gas or liquid (page 2, lines 3-17 and Figures 1 and 2); and jetting the gas or the liquid from the selected one or more nozzles upon an inclined side surface of the receiver to convey a force in a direction perpendicular to the direction of the jetting gas or liquid (i.e. due to the curvature of the receiver, when the air hits the curved side of the receiver, the force received inherently includes a perpendicular force) (page 2, lines 3-17 and Figures 1 and 2), the concave center unit of the receiver declining radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (page 2, lines 3-17 and Figures 1 and 2).

As noted above, the invention of Suzuki teaches many of the features of the claimed invention and while the invention of Suzuki does teach an air receiver

including a concave center unit that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit, Suzuki does not explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry.

DeBerg teaches a windmill comprising a rigid air receiver (column 4, lines 1-3) including a concave center unit (i.e. "24A") that declines radially outward from an axis of symmetry of the receiver to an outer border of the concave center unit (column 2, lines 52-59, column 3, lines 23-28, and Figure 3) and an inclined side surface unit (i.e. inclined side surface of "26A") that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry (column 2, lines 52-59, column 3, lines 23-28, and Figure 3).

It would have been obvious to one having ordinary skill in the art to modify the air receiver in the invention of Suzuki to explicitly include an inclined side surface unit that inclines radially outward from the outer border of the concave center unit with respect to the axis of symmetry, as taught by DeBerg, because DeBerg suggests a corresponding air receiver that would have improved the invention of Suzuki by providing a receiver with additional concave units that will occupy a larger space, consequently, a larger number of air jets in Suzuki, and make the maximum use of the force detection and haptic feedback system (column 3, lines 23-33).

5. Claims 6 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suzuki et al. in view of DeBerg and further in view of JP Patent Application Publication No. 2004-157677 to Iwaki et al.

As noted above, the invention of Suzuki and DeBerg teaches many of the features of the claimed invention and while the invention of Suzuki and DeBerg does teach a force feedback method/apparatus wherein a position or an orientation of an inclined side surface unit is changed according to a position or the orientation of the receiver, the combination is not explicit in providing a deformation mechanism means for changing a position or an orientation of the inclined side surface means, the force feedback apparatus further comprising receiver inclined side surface control means for controlling the deformation mechanism according to the position or the orientation of the receiver means measured by a receiver measurement unit.

Iwaki teaches a multi-flexible driving mechanism and virtual reality system for receiving force caused by jets of air as part of a force feedback apparatus (0001, lines 1-4 and 0010, lines 1-9) wherein a receiver is provided with a deformation mechanism for changing a position or an orientation of the inclined side surface unit (0012, lines 1-8 and 0014, lines 1-6), the force feedback apparatus further comprising receiver side surface unit control means for controlling the deformation mechanism according to the position or the orientation of the receiver measured by the receiver measurement unit (0023, lines 1-7, 0027, lines 1-16, and 0030, lines 1-11).

It would have been obvious to one having ordinary skill in the art to modify the invention of Suzuki and DeBerg to specify a deformation mechanism means for changing a position or an orientation of the inclined side surface means, the force feedback apparatus further comprising receiver inclined side surface control means for controlling the deformation mechanism according to the position or the orientation of the receiver means measured by a receiver measurement unit, as taught by Iwaki, because, as suggested by Iwaki, the combination would have improved the system of Suzuki and DeBerg by providing additional control and, consequently, more accurate force detection through use of a multi-flexibility drive mechanism (0023, lines 1-7, 0027, lines 1-16, 0030, lines 1-11, and 0041, lines 1-10).

Response to Arguments

6. Applicant's arguments with respect to claims 1-3, 5-7, 9-11, and 13-15 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to Applicant's disclosure.

U.S. Patent Application Publication No. 2004/0164960 to Jacobus et al. teaches a force feedback system and actuator power management.

U.S. Patent No. 6,433,771 to Yocum et al. teaches haptic device attribute control.

U.S. Patent No. 5,583,478 to Renzi teaches a virtual tactile system.

U.S. Patent No. 6,046,726 to Keyson teaches a virtual workspace with user-programmable tactile feedback.

U.S. Patent No. 5,459,382 to Jacobus et al. teaches a method and system for providing a tactile virtual reality and manipulator defining an interface device therefore.

JP Patent Application Publication No. 2001-022499 to Suzuki et al. teaches an inner force sense presenting device by wind pressure in virtual space.

Amemiya et al., Portable Tactile Feedback Interface Using Air Jet" teaches portable force feedback displays.

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey R. West whose telephone number is (571)272-2226. The examiner can normally be reached on Monday through Friday, 8:30-5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eliseo Ramos-Feliciano can be reached on (571)272-7925. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jeffrey R. West/
Primary Examiner, Art Unit 2857

December 6, 2010